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SYNERGY OF FARNESOL AND ANTIBIOTICS AGAINST PLANKTONIC *VERSUS* BIOFILM CELLS OF *STAPHYLOCOCCUS EPIDERMIDIS*

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Staphylococcus epidermidis is the most frequent cause of nosocomial sepsis and catheter-related infections, in which biofilm formation is considered to be one of the main virulence mechanisms. Moreover, their increased resistance to conventional antibiotic therapy enhances the need to develop new therapeutical agents. Farnesol, a quorum-sensing molecule in *Candida albicans*, has been described as impairing bacterial growth. The goal of this study was to evaluate the synergistic effect of farnesol and antibiotics on planktonic and biofilm cells of *S. epidermidis* strains (1457 and 9142). To accomplish that, three antibiotics with different mechanisms of action were tested: vancomycin (cell wall synthesis inhibitor), tetracycline (Protein synthesis inhibitor) and rifampicin (RNA synthesis inhibitor). A 24 h kinetic study was performed using these antibiotics at the peak serum concentration along with farnesol at concentrations of 30, 100, 200 and 300 µM. To evaluate planktonic cells viability, it was used two tests: a rapid colorimetric method that is based on the reduction of tetrazolium salt (XTT) to measure mitochondrial cellular activity and standard colony forming units enumeration (CFU). The growth inhibition effect of farnesol and/or antibiotics on biofilm cells of *S. epidermidis* was assessed by XTT, CFU enumeration and Crystal Violet, which measures total biomass of biofilm.

In planktonic as well as in biofilm cells, both strains of *S. epidermidis* studied were much less susceptible to farnesol than to all the antibiotics tested. All the antibiotics were highly effective against planktonic cells. Biofilm cells were much less susceptible than planktonic cultures to vancomycin, tetracycline and rifampicin. In planktonic cells it was not observed a synergistic effect of farnesol and any of the antibiotics used, except for the strain 9142 when treated with vancomycin. In biofilms, there was a synergistic effect of farnesol and all antibiotics, expressed by the reduction of biomass and mitochondrial cellular activity of biofilm cells. The susceptibility of biofilm cells to farnesol and antibiotics was higher when the antibiotic tested was rifampicin, followed by tetracycline and finally by vancomycin.